

**Deer Park Fire
Water and Fire Suppressant Sampling Plan
Draft March 30, 2019**

1.0 INCIDENT SUMMARY

On Sunday, March 17, 2019, a fire broke out at Intercontinental Terminals Company LLC (ITC) resulting in firewater discharge from ongoing emergency response activities. This initial Water Sampling Plan describes proposed sample collection in both potentially affected and unaffected (e.g., reference) areas to document surface water quality conditions. The plan also addresses collection of the following types of samples: fire suppression material (source, unused), released/weathered fire suppression material (used), and surface water.

2.0 PURPOSE AND OBJECTIVES

Samples of the source foam, surface and sub-surface water provide information that may be useful for assessing potential environmental effects and clean-up actions.

Sampling objectives include, but are not limited to:

- Document reference as well as potentially affected areas (i.e., areas upstream and downstream of incident location);
- Define the spatial and temporal extent of areas potentially affected by fire water runoff; and
- Document the chemical compositions of the fire suppression material.

This plan does not address sampling of residual product from tanks which will be scheduled when conditions are safe.

3.0 HEALTH AND SAFETY

Safety is the most important consideration when implementing this plan. All field team members will read the incident-specific site health and safety plan (HASP) and receive a daily safety briefing before going into the field. A daily tailgate safety meeting must be held prior to any field work and a written record of the daily tailgate safety meeting, including signatures of all personnel present, will be maintained.

Field team members collecting samples by boat will receive a boat safety briefing by the boat operator prior to leaving the launch area. When on the water, field team members will wear personal flotation devices at all times. Good judgment must be used, particularly when considering fieldwork during inclement weather and/or in the vicinity of other marine traffic particularly heavy shipping. No sampling will be conducted in the dark. While working on the shoreline, field team members should be mindful of slippery surfaces (e.g., rocks) and sharp objects. Field team members should wear safety glasses, sunscreen, appropriate footwear (safety toe), and other personal protective equipment (PPE) as required by the Safety Officer. Any incident will be promptly reported to the Environmental Unit Lead, who will notify Incident Command.

When collecting samples in impacted areas, field sampling team members will wear appropriate protective equipment (e.g., FRCs) as needed. When sampling for PFAS, field staff should NOT wear any waterproof clothing, waterproof footwear, or Tyvek. Field crews should also stay away from waterproof paper and plastic clipboards to minimize potential cross-contamination. Nitrile gloves will be worn when sampling and must be changed between each sampling site.

The sample containers for benzene, toluene, ethylbenzene, and xylene (BTEX) analyses contain acid (HCL) as a preservative, which may be harmful to sampling personnel. Extra care must be taken to prevent worker exposure to these preservatives and loss of the preservatives during sample collection.

Wet sampling supplies become slippery and can easily be dropped. It is recommended that at least one spare bottle for each analysis type be kept with a sample team at all times as ready replacements for equipment that could potentially become contaminated during sampling.

4.0 SAMPLING

4.1 Overview

Surface water and sub-surface sample locations are proposed in the attached figure; sample locations of fire suppression material and/or residual tank contents are to be determined. Sampling should be prioritized as follows:

- Surface water samples in areas potentially affected by the fire water runoff (as deemed safe and permissible); and
- Surface water samples from unaffected areas;
- Sub-surface water samples co-located in a sub-set of surface water locations; and
- Source fire suppression material samples.

Collection of source suppression/foam samples will be coordinated with operations and safety personnel. Collection of water samples will be conducted by vessel. Sampling procedures and laboratory analyses are described in greater detail below.

4.2 Procedures

This section describes general methods for collecting unused fire suppression material, released (used) fire suppression material, and surface water specific to the Deer Park fire. The sampling team will document field-derived information, observations, and other field data in field logbooks. Information in the logbook should include sampling details (i.e., field team members, sampler name, sample type, location (GPS coordinates, and time/date) and other observations (i.e., presence of wildlife and humans, visual observations, weather). For complete details about field documentation procedures, refer to Cardno's *Field Documentation Standard Operating Procedure (SOP)* (2016a).

GPS coordinates will be recorded for each sampling location. Prior to conducting any sampling and after recording the GPS coordinates for the location, photographs or videos should be taken of the sampling site.

4.3 Fire Suppression Material

4.3.1 Sample Methods

Fire suppression material sample(s) will be collected directly from totes that include the source material when they are moved out of the hot zone. Appropriate health and safety precautions will be followed, including use of required PPE. Sample collection will be coordinated with ITC operations personnel through the Environmental Unit Lead.

Fire suppression source material will be directly filled into appropriate bottleware per Table 6-1 below. If gloves come into contact with the source sample, change gloves and take another sample. If additional sources are sampled, change gloves between each sample.

Prior to collecting samples, record date, time, source (e.g., tote ID, company, etc.), type of sample, and location (GPS coordinates). Collect photos, of area and tote, during sample collection as feasible and permissible.

Mark the label using the following nomenclature:

Matrix-YYYYMMDD-Type (Source Foam)-Replicate

Ex. FOAM-20180719-SF-001

Immediately place samples in ice chest with wet ice, or place the samples in a refrigerator until they can be shipped. PFAS samples should never come into contact with blue ice. Keep source sample(s) separate from other samples at all times. Section 5 contains more details regarding sample handling and sample custody.

Samples will be shipped, under proper chain of custody (COC), to ALS Laboratory in Kelso, Washington. Source samples should be shipped separately from all other environmental samples.

4.3.2 *Chemical and Physical Analyses*

Source samples will initially be archived. A PFAS analysis of the fire suppression material may be conducted as needed.

4.3.3 *Released Suppression Material Sampling*

Released fire suppression material samples (up to 3 samples) will be opportunistically collected if material is encountered during sampling activities.

4.3.4 *Sample Methods*

Samples will be collected by hand directly into appropriate bottleware taking care to avoid collecting water. Table 6-11 provides more details on sample volume and containers.

Prior to any sampling, field teams will mark the station location with GPS, photograph or video of the sampling site.

Label sample containers using the following nomenclature,

Matrix-YYYYMMDD-Type (Weathered Foam)-Replicate

Ex. FOAM-20180619-WF-001

Immediately place samples on wet ice, or place the samples in a refrigerator until they can be shipped. PFAS samples should never come into contact with blue ice. Keep released fire suppression sample(s) separate from other samples at all times. Section 5 contains more details regarding sample handling and sample custody.

Samples will be shipped, under COC, to ALS Kelso, Washington. Released suppression material samples should be shipped separately from all other environmental samples.

4.3.5 *Chemical and Physical Analyses*

Released suppression material samples will be archived for potential analysis of PFAS if warranted.

4.4 Surface Water Sampling

4.4.1 Proposed Sample Locations

Samples will be collected within the diked tank farm known as the 2nd 80s tank farm, if available. Surface and sub-surface water will be collected east and west of the release site (Table 4-1 and Figure 4-1). Depending on field conditions and logistical considerations, further sampling locations may be added. Reference water samples will be collected outside of the observable affected area.

Table 4-1 Sampling Locations

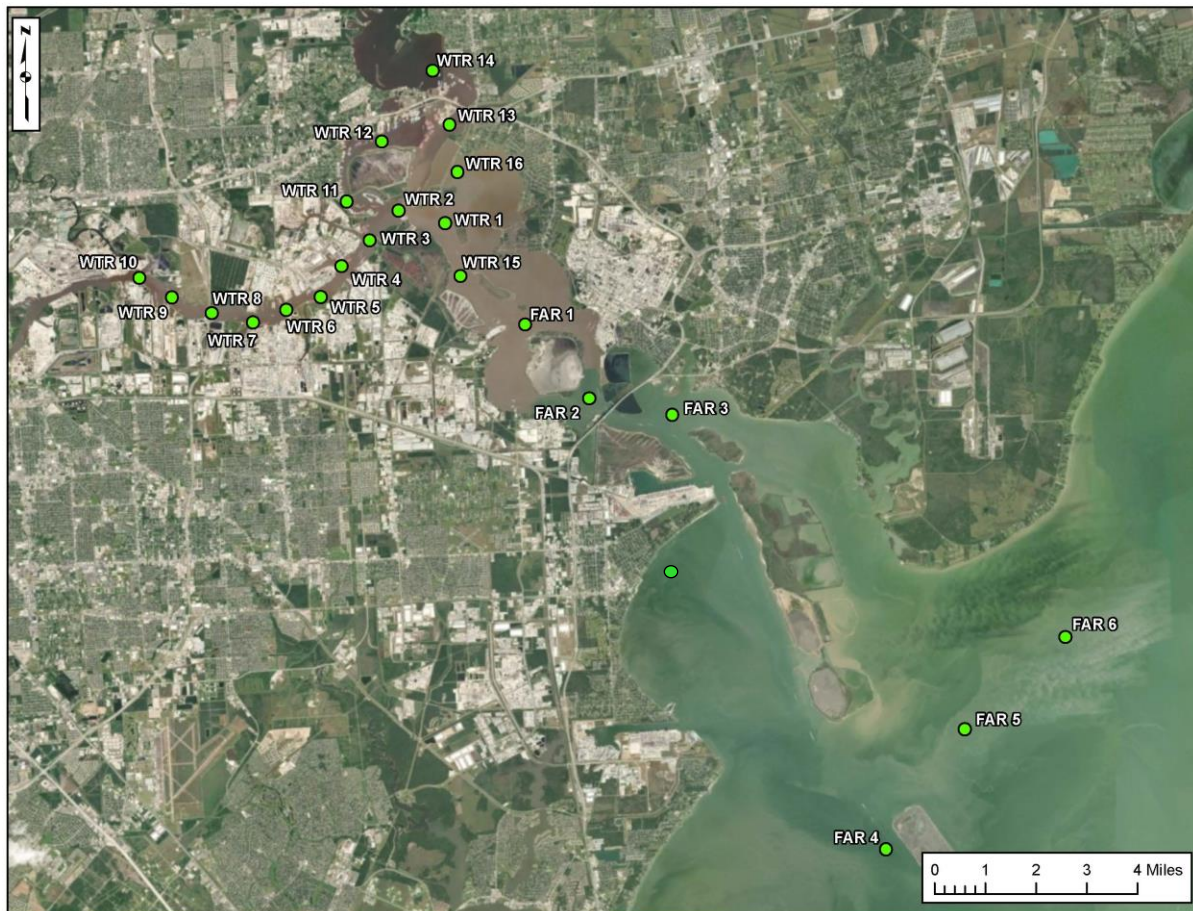


Figure 4-2 Sampling Locations

Name	Latitude	Longitude
Water 1	29.759221	-95.067987
Water 2	29.763276	-95.083139
Water 3	29.754971	-95.092929
Water 4	29.747843	-95.102444
Water 5	29.739321	-95.109662
Water 6	29.735982	-95.121056
Water 7	29.732706	-95.132049
Water 8	29.735670	-95.145481
Water 9	29.740608	-95.158351
Water 10	29.746453	-95.168766
Water 11	29.766314	-95.100014
Water 12	29.783064	-95.087790
Water 13	29.787265	-95.065423
Water 14	29.802878	-95.070377
Water 15	29.743952	-95.063512
Water 16	29.773681	-95.063420
Farfield 1	29.729426	-95.042841
Farfield 2	29.707780	-95.022771
Farfield 3	29.702289	-94.995626
Farfield 4	29.576069	-94.930614
Farfield 5	29.634915	-94.869519
Farfield 6	29.609615	-94.903418
Farfield 7	29.65428	-94.99974

4.4.2 *Sample Methods*

Prior to collecting surface water samples, visible foam or material on the water surface should be moved aside with a water hose, compressed air, or paddle. Care should be taken not to disperse product into the water column. Avoid sampling downwind of solvents or engine exhaust. This is usually avoided by approaching the sampling location into the wind and current if practical.

Surface water samples will be collected by hand. Sub-surface water will be collected with a decontaminated 8 foot pole sampler. Water samples will be collected in pre-cleaned bottleware, obtained from the laboratory. Table 6-2 provides more details on sample volume and containers. Decontamination consists of a Liquinox wash, distilled water rinse, and a final rinse with deionized water. For details regarding sampling methods, refer to the *Cardno Water Sampling SOP* (Cardno 2015a). Appropriate Quality Control (QC) samples should be collected as described in Section 7.0.

Prior to any sampling, and after marking the station location by collecting GPS points, photograph the sampling site. Take photos in both of the general sampling area, making sure to capture structures, etc. for geographical reference.

After collecting samples, seal the sample containers, label, and immediately place in an ice chest with wet ice. Label sample jars using the following nomenclature,

Matrix-YYMMDD-Location Code-Replicate-Team Number

Sub-surface Ex. WT-20180619-WTR1SS-001

Water samples will be, shipped under proper COC, to ALS in Kelso, WA. Environmental samples should be shipped separately from source and weathered material samples.

4.4.3 *Chemical Analyses*

Samples will be analyzed for PFAS (surface water only), alkylated polycyclic aromatic hydrocarbons (PAHs), BTEX, and metals (surface water only). Further details can be found in Table 6-2. After reviewing results and field conditions, ITC and/or Cardno may make changes to these analyses.

5.0 SAMPLE HANDLING AND SAMPLE CUSTODY

Sample containers and preservatives will be provided by the laboratory. Samples will be placed in individual pre-cleaned containers for shipment to the laboratory. Samples will be collected and stored in accordance with EPA specifications, American Society for Testing and Materials (ASTM) standards, SOPs, and the requested analytical methods. Field personnel will keep samples cold by placing wet ice in the coolers in which samples will be stored until delivery to the analytical laboratory.

A COC record will be utilized to maintain the integrity of the samples during the collection, storage, and transportation of samples. COC forms should accompany field samples at all times. When transferring possession of the samples, the individuals relinquishing and receiving the samples should sign, date, and note the time of transfer on the COC form. Samples should remain in the physical possession of the person assigned to the samples until they are transferred to another individual or shipped to the laboratory. For additional details refer to Cardno's *Sample Custody Procedures SOP* (2016c).

6.0 LABORATORY ANALYSES

The following tables summarize the potential laboratory analyses, required sample volumes, sample containers, and preservation methods. Laboratory analyses may be modified during the course of sampling and will be approved by prior to proceeding with any changes.

Table 6-1 summarizes the laboratory analyses, required sample volumes, appropriate sample containers, preservation methods, and holding times for source fire suppression material samples.

Table 6-1 Source and Released Fire Suppression Material Sample Analyses				
Analyte	Test Method ¹	Sample Volume and Containers ^{2, 3}	Preservation	Sample Holding Time ⁴
PFAS	537.1	Teflon-free high density polyethylene	Cool 4°C	28 days
¹ Additional test methods may be used that are specific for the analytical laboratory, media/oil type, or as required by regulatory agency. ² Sample size excludes volumes for QA/QC analyses (i.e., replicate sample analyses). It is recommended that all samples be collected in duplicate containers in case of breakage during storage, transport or shipping. (Additional volumes required for collecting samples in duplicate containers are not included). ³ Oil samples and any samples containing oil should be collected in vials with hard caps only. Soft septum caps should not be used as the oil may leak and could compromise all samples in the same shipping container. ⁴ Sample holding times are not applicable to oil samples.				

Table 6-2 summarizes the laboratory analyses, required sample volumes, appropriate sample containers, preservation methods, and holding times for water samples.

Table 6-2 Laboratory Analyses for Water Samples				
Analyte	Test Method ¹	Sample Volume and Containers ²	Preservation	Sample Holding Time ³
Alk PAH	SW846-8270D SIM	Two 1-L amber glass; Teflon-lined cap	4 °C	7 days to extract; 40 days for extract
BTEX	SW846-8260C	Three 40 mL glass vials, Teflon-lined septum	No headspace, HCl, 4 °	14 days
Metals*	SW846-6010	500 mL HDPE	HNO3	6 months
PFAS*	537.1	Teflon-free HDPE	4 °C	28 days
¹ Additional test methods may be used that are specific for the analytical laboratory, media/oil type, or as required by regulatory agency. ² Sample size excludes volumes for QA/QC analyses (i.e., replicate sample analyses). It is recommended that all samples be collected in duplicate containers in case of breakage during storage, transport or shipping. (Additional volumes required for collecting samples in duplicate containers are not included). ³ Sample holding time before extraction. * Sub-surface samples not analyzed for these parameters.				

7.0 QUALITY CONTROL SAMPLES

The sampling coordinator will coordinate with the laboratory prior to sampling to ensure that the appropriate analytical methods and detection limits are used (i.e., detection limits will be below proposed benchmarks). Additional samples will be collected for quality assurance/quality control (QA/QC) purposes. QC samples will include trip blanks, field blanks, field duplicates, and Matrix Spike/Matrix Spike Duplicates (MS/MSD). Trip blanks will be provided by the laboratory, at a frequency of one per cooler containing samples submitted for BTEX and/or PFAS analysis, must contain deionized water, and will accompany sample containers into the field and be returned to the laboratory without being opened. Field blanks will be samples of DI water that are transferred from original container to empty container while in the field, only newly filled bottles need to be sent back to the lab. Field duplicate samples will be collected for water and will be submitted to the laboratory “blind.” MS/MSD samples are triplicate volume which includes the original sample. Field duplicates and MS/MSD samples will be collected at a rate of 1 per 20 field samples and field blanks will be collected once per sampling day. All QC samples will be analyzed for the same laboratory parameters as field samples.

8.0 DATA QUALITY ASSURANCE

As part of the Quality Assurance (QA) process, a standardized process will be established for collecting, reviewing, and tracking field data and sample custody information recorded during field sampling activities, and uploading this information into a project database and/or centralized project records (e.g., electronic filing system). Incorporation of these data management tools is important for assembling the required information in a timely manner and will aid in on-going data reporting efforts.

An important principle, applicable to all data and documents collected and prepared, is that they are potential evidence in legal matters of considerable importance to many parties. As such, they must be correctly, completely, and accurately recorded in a timely manner, and fully safeguarded.

9.0 ROLES AND RESPONSIBILITIES

Sampling Team Points of Contact from Cardno:

On-site

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Additional sampling may be conducted by ITC, EPA, or TCEQ.

10.0 REFERENCES

Cardno. 2015a. Standard Operating Procedures for Sampling Water.

Cardno. 2016a. Standard Operating Procedures for Field Documentation Procedures.

Cardno. 2016b. Standard Operating Procedures for Sampling Source Oil, Fresh Oil, Weathered Oil, and Sheen.

Cardno. 2016c. Standard Operating Procedures for Sample Custody Procedures.